

Response under 37 C.F.R. §1.111
Serial No. 10/069,532
Attorney Docket No. 020245

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1 – 4, 7 – 14 and 17-20 are pending in the present application. Claims 1 – 4, 7 – 14 and 17-20 stand rejected. The rejections set forth in the Office Action are respectfully traversed below.

The specification has been amended to correct a minor informality. Approval and entry of the amendments to the specification are respectfully requested.

Claim rejections – 35 U.S.C. §103

Claims 1-4, 7-12 and 17-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over **Dunstan** (U.S. Patent No. 5,572,110) in view of **Koenck** (U.S. Patent No. 4,961,043). Claims 13 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over **Dunstan** and **Koenck** as applied to claims 3 and 4 above, and further in view of **Chalasani et al.** (U.S. Patent No. 5,969,436). For the reasons set forth in detail below, these rejections, to the extent they are considered to apply to the amended claims, are respectfully traversed.

The present invention is directed to a battery powered electric device having a battery charging device capable of charging the battery at appropriate times and accurately determining the remaining capacity of the battery.

For example, in accordance with the present invention, the battery charging device includes an operation and display unit 13, which may effect a time-specified charging mode or a completion-time-specified charging mode by setting a charge starting time or a charge completion time, respectively (see, e.g., application specification, page 8, lines 7-10).

By way of example, when charging is performed according to a specified charge starting time, a charge starting time is entered by operation of the operation and display unit 13 and the charge starting time is stored in a memory of a charger 8. A time required to charge is then calculated by the charger 8 based on the remaining capacity of the battery 2, 3. Present time information is obtained from a timer 4 and compared with the stored specified charge starting time. When the present time corresponds to the specified charge starting time, charging begins. See, for example, the flowcharts of Figs. 5 and 6 and accompanying description.

Dunstan discloses a smart battery charging system for a charging a smart battery 82. As shown in Fig. 4, the smart battery 82 includes a rechargeable battery 80, a current measuring circuit 74, a voltage measuring circuit 76, and an environment monitoring circuit 78. The current measuring circuit 74, voltage measuring circuit 76, and environment monitoring circuit 78 measure the current, voltage and environment (i.e., temperature), respectively, of the battery 80.

The smart battery 82 also includes a microcontroller 56 having a clock 59, logic unit 58 and non-volatile memory 60 to store information, such as a user specified discharge rate 70 and a user-specified charge rate 71. The clock 59 is a digital timer, counter or clock that provides logic unit 58 with elapsed time information. Clock 59 can also generate interrupts to cause logic unit 58 to perform actions, such as updating the present capacity value 64 (see column 9, lines 22-25).

Dunstan does not disclose or suggest a display and operation unit having a time setting function for a timer and a time displaying function, as recited in independent claims 1 and 3. Further, **Dunstan** does not disclose or suggest an interface, as recited in claims 1 and 3, to connect a changer via a system bus to the battery based on information from the measuring means and/or the memory, and time information from the timer.

The Office Action asserts (page 2, item 1) that a run-time alarm value 62 and a present run-time value 63 stored in the non-volatile memory 60 correspond to “time setting functions.” However, the run-time alarm disclosed by **Dunstan** is an indication or warning of low battery conditions issued when the battery has less than a fixed amount of time remaining at the present discharge rate. In other words, the run-time alarm may be triggered if the remaining life of the battery is less than a fixed amount of time according to the formula: (estimated battery capacity/present discharge rate) < fixed alarm time (see, e.g., column 2, lines 5-12).

A user may program the run-time alarm value 62 to trigger a remaining run-time alarm when the battery is predicted to have a remaining life of, for example, 5 minutes (see column 10, lines 27-29). Moreover, the present run-time value 63 (i.e., the remaining run time or remaining battery life) is calculated based on the remaining capacity value and the present discharge rate of the battery (column 10, lines 54-59).

Thus, the present run-time value is a *predicted* value of remaining battery life and the run-time alarm value is a *fixed* value (e.g., 5 minutes) that is compared to the predicted value of remaining battery life to determine whether an alarm should be triggered. The present run-time value and the run-time alarm value are not associated with the timer 59 and are *not* time setting functions for the timer 59.

Moreover, the only functions of the clock 59 disclosed by **Dunstan** are that of measuring elapsed time and generating interrupts. **Dunstan** does not disclose or suggest that the clock 59 has a *time setting* function associated therewith. In contrast, according to the claimed invention the display and operation unit has a time setting function for a timer and a time displaying function.

Response under 37 C.F.R. §1.111
Serial No. 10/069,532
Attorney Docket No. 020245

The Office Action recognizes that **Dunstan** does not disclose or suggest a display and operation unit having a time displaying function, as recited in independent claims 1 and 3. The Office Action relies on **Koenck** for disclosure of a display related to battery charging.

Firstly, **Koenck** does not alleviate any of the above-noted deficiencies of **Dunstan**. Secondly, **Koenck** does not disclose or suggest a display having a time displaying function for a battery charger. The display screen 12 of **Koenck** displays digits representing battery conditions, but lacks disclosure of a time displaying function.

In view of the above noted deficiencies of **Dunstan** and **Koenck**, it is respectfully submitted that the combination does not result in the claimed invention. Reconsideration and withdrawal of the rejection of independent claims 1 and 3, and claims 2, 4, 7 – 12 and 17 – 20, which depend therefrom, are respectfully requested.

Dependent Claims 2, 4, 7-12 and 17-20

Claims 2, 7 and 17 depend from independent claim 1. Claims 4, 8 – 12 and 18 – 20 depend from independent claim 3. Each of dependent claims 2, 7 - 12 and 17 – 20 distinguish over the combination of **Dunstan** in view **Koenck** for at least the reasons set forth above with respect to independent claims 1 and 3.

Moreover, as discussed below, the dependent claims recite additional features not disclosed or suggested by the cited prior art.

For example, dependent claims 11 and 12 recite that the display and operation unit is provided with a time specifying means for specifying a charge starting time, and the charger is provided with means for starting charge of the battery at a time specified by the time specifying means. Moreover, each of dependent claims 17 – 20 recite means actuated at a time specified by the timer for managing a residual capacity of the second battery based on a self discharge amount and a consumption capacity according to properties of the secondary battery.

Neither **Dunstan** nor **Koenck** disclose or suggest the above-noted features, and particularly, specifying a charge starting time or managing a residual capacity of a battery at a time specified by a timer.

The Office Action asserts that the logic unit 58 of **Dunstan** specifies a charge starting time (see Office Action page 3, item 5). However, there is nothing in the **Dunstan** disclosure that teaches or suggests that the logic unit 58 starts charging at a time specified by a display and operation unit (claims 11 and 12) or managing a residual capacity of a battery at a time specified by a timer (claim 17 – 20).

Response under 37 C.F.R. §1.111
Serial No. 10/069,532
Attorney Docket No. 020245

Therefore, it is respectfully submitted that the dependent claims distinguish over the cited prior art for these additional reasons.

Claims 13 and 14

Claims 13 and 14, which depend either directly or indirectly from independent claim 3, were rejected under 35 U.S.C. §103 over **Dunstan** and **Koenck** as applied to claims 3 and 4, and further in view of **Chalasani et al.**

Initially, it is respectfully submitted that each of claims 13 and 14 distinguish over the cited prior art for the same reasons set forth above with respect to independent claim 3.

Further, it is submitted that **Chalasani et al.** do not disclose or suggest the features recited in claims 13 and 14, and therefore the proposed combination of references does not result in the claimed invention. Specifically, each of claims 13 and 14 is directed to embodiments in the invention wherein the display and operation unit includes a time specifying means for specifying a charge completion time, and the charger includes means for starting charge so that charge for the battery is completed at a time specified by the time specifying means.

Response under 37 C.F.R. §1.111
Serial No. 10/069,532
Attorney Docket No. 020245

The Office Action asserts that the features recited in claims 13 and 14 are disclosed as the timer 260 of **Chalasani et al.** However, **Chalasani et al.** merely disclose that “the timer 260 and temperature transducer 270 provide information to the controller 250 to control charging of the battery 220” (see column 4, lines 19-21). **Chalasani et al.** are completely silent with respect to any other function of the timer 260, and the Office Action has not pointed out any other function of the timer 260.

In the absence of the further disclosure of the function of timer 260, it is submitted that **Chalasani et al.** do not disclose or suggest the features recited in claims 13 and 14, and that the proposed combination of references does not result in the claimed invention.

Response under 37 C.F.R. §1.111
Serial No. 10/069,532
Attorney Docket No. 020245

CONCLUSION

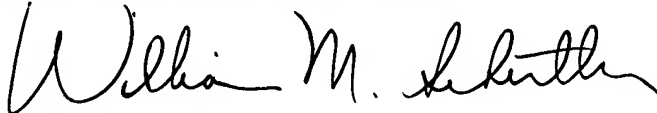
For the reasons set forth in detail above, it is respectfully submitted that all pending claims are in condition for allowance. An indication of allowability of all pending claims is respectfully requested.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

In the event that any fees are due in connection with the filing of this paper, please charge any fees to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

A handwritten signature in black ink, appearing to read "William M. Schertler". The signature is fluid and cursive, with the first name "William" being the most prominent part.

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